

northeast or in the direction of the moving storm-cloud. At the town of Maitland, buildings were moved from their foundations and several unroofed. Clare, Clare Co., Mich., 22d, terrific hurricane during the night accompanied by violent thunder and lightning; great damage to property over a wide extent of country. In vicinity of Atwood's stations over 2,000,000 feet of timber was blown down; trees were "snapped off like pipe-stems" and the work of destruction was awful in its suddenness and completeness. Lansing, Ingham Co., Mich., 22d, very violent wind storm with terrific lightning, property destroyed to the value of \$25,000. Elmira, N. Y., 25th, gale lasted about 2 minutes, during which time it unroofed a large hotel, carried the roof of the Palace car shops over and several hundred feet beyond the adjoining freight building. Many houses were unroofed and windows blown out, church steeples thrown over and trees uprooted or broken off close to the ground. Rain fell in torrents, increasing the already serious loss of property. Owatonna, Minn., 29th, most destructive storm in the history of this region; about 100 small structures were more or less damaged; loss estimated at \$10,000. Wantoma, Wis., 29th., about 5 p. m. violent tornado passed near station from SSW. to NNE. through the countries of Washara and Waupaca. Preceding the storm, clouds in the western heavens looking like great sheets of white smoke, were dashed about in the wildest manner and finally combining in a long spout-like mass descended to the earth, over which it moved with great speed. Houses, barns and out-buildings in the path of the storm were completely torn to pieces; fences were strewn over the woods, corn fields swept clean, hay and grain stacks destroyed and the largest trees "snapped off like pipe-stems;" whole destruction consumed about 15 minutes. Width of storm path 80 rods, length 12 to 15 miles. In passing over Sandbar lake the storm formed a water-spout which carried up a great quantity of water and considerable fish upon the adjoining land. Stanton, Stanton Co., Nebr., 29th., about 9 p. m., tornado passed from SW. to NE., destroying a portion of the town; storm came up with a rushing, roaring noise like a heavy stock train and passed through the village with lightning rapidity, "it was gone in an instant." People were crazed by the sudden and awful awakening from slumber, and many were stripped of clothing, drenched with rain and severely injured by flying *debris*. Ten houses were completely leveled to the ground; path of storm about 300 yards wide. Emporia, Kans., 29th, 6.30 p. m., north and west of this city a terrible wind storm passed from WNW. to ESE. down the valley of the Neosho destroying an immense amount of farm property and killing 4 persons; 42 buildings were completely demolished and 10 to 15 more or less injured. Most destructive storm since the terrible tornado of 1878, and passed over about the same path as the tornado of June, 1881. Between Emporia and Howard the storm expended itself in an unusually heavy fall of rain accompanied by the most terrific display of lightning. At one place in the storm's path a flock of sheep valued at \$5,000 were all killed. Width of track from 3 to 100 rods; through the timber on Neosho river 30 rods. Lind, Wis., 29th, about 7 p. m., tornado, doing a vast amount of damage in town and country; in the former five buildings were completely blown to pieces and several others badly damaged. Centralia, Nemaha Co., Kans., 29th, about 6 p. m., violent wind storm five miles south of station; several buildings and much farm property destroyed.

VERIFICATIONS.

Indications.—The detailed comparison of the tri-daily indications for September, with the telegraphic reports for the succeeding twenty-four hours, shows the general percentage of verifications to be 86.47 per cent. The percentages for the four elements are: Weather, 89.94; Direction of the Wind, 80.80; Temperature, 89.21; Barometer, 85.59 per cent. By geographical districts they are: For New England, 83.42; Middle Atlantic states, 87.61; South Atlantic states, 90.12; Eastern Gulf states, 91.08; Western Gulf states, 92.47; Lower Lake region, 84.98; Upper Lake region, 84.19; Tennessee and the Ohio valley, 86.57; Upper Mississippi valley, 83.87; Lower Missouri valley, 78.62; Northern Pacific coast region, 90.90; Central Pacific coast region, 100.00; Southern Pacific coast region, 100.00. There were 77 omissions to predict (47 being due to the absence of reports from the Pacific coast), out of 3,690, or 2.08 per cent. Of the 3,613 predictions that have been made, 111, or 3.07 per cent are considered to have entirely failed; 131, or 3.63 per cent. were one-fourth verified; 371, or 10.27 per cent. were one-half verified; 373, or 10.32 per cent. were three-fourths verified; 2,627, or 72.71 per cent. were fully verified, so far as can be ascertained from the tri-daily reports.

Cautionary Signals.—Seventy-seven Cautionary signals were displayed during the month, of which, 63, or 81.82 per cent. were fully justified by winds of twenty-five miles per hour or over, at or within a radius of 100 miles of the station. Two Off-shore signals were displayed, neither of which were fully justified; one was justified as to direction only, and the other failed with regard to both direction and velocity. Seventy-nine signals of both kinds were displayed, of which 63, or 79.75 per cent. were fully justified. The above does not include signals ordered at display stations where the velocity is only estimated. Seventy winds of twenty-five miles or over were reported for which no signals were ordered. Twenty signals were ordered late.

NAVIGATION.

Stage of Water in Rivers.—In the table on the right-hand side of chart No. III are given the highest and lowest stages of water, as observed at Signal Service stations during the month of